

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 04-330783

(43)Date of publication of application : 18.11.1992

(51)Int.Cl.

H01L 29/784
H01L 21/318
H01L 23/29
H01L 23/31

(21)Application number : 03-133672

(71)Applicant : CANON INC

(22)Date of filing : 27.03.1991

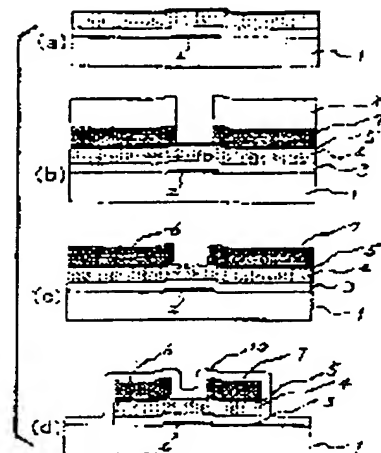
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(54) THIN FILM SEMICONDUCTOR DEVICE

(57)Abstract:

PURPOSE: To increase the humidity resistance of a thin film semiconductor device by a method wherein the total number of hydrogen atoms bonded to the respective atoms of nitrogen atoms and silicon atoms in a silicon nitride film which is used as an insulating layer film which is located on a semiconductor layer and metallic electrodes, is set in such a way as to become a specified atomic % or lower.

CONSTITUTION: A Cr gate electrode 2 is formed on a glass substrate 1 and thereafter, a hydrogenated amorphous silicon nitride film 3, an amorphous silicon layer 4 and a N-layer 5 are deposited in order and continuously on the whole surface by a plasma CVD method. Then, an aluminium film is deposited on the whole surface and source and drain electrodes 6 and 7 are formed using a photosensitive resist 8. Then, after the layer 5 is etched in a prescribed depth by a RIE method using the photosensitive resist 8 as a mask, the resist 8 is peeled. Then, a TFT undergoes an inter-element isolation by etching using an RIE method and a protective layer 10 which is a silicon nitride film is deposited on the whole surface. At this time, the density of hydrogen atoms bonded to the respective atoms of nitrogen atoms and silicon atoms in the silicon nitride film is set in such a way as to become 35 atomic %. Thereby, a thin film semiconductor device having a durability and a stability is easily obtained.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平4-330783

(43) 公開日 平成4年(1992)11月18日

(51) Int.Cl. ³	識別記号	庁内整理番号	F I	技術表示箇所
H 0 1 L 29/784				
21/318	B	8518-4M		
23/29				
		9056-4M	H 0 1 L 29/78	3 1 1 G
		8617-4M	23/30	D
審査請求 未請求 請求項の数 1 (全 12 頁) 最終頁に続く				

(21) 出願番号 特願平3-133672

(22) 出願日 平成3年(1991)3月27日

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(54) 【発明の名称】 薄膜半導体装置

(57) 【要約】 (修正有)

【目的】 前記薄膜トランジスタ、薄膜トランジスタ型光センサーなどの薄膜半導体装置の保護膜に用いる窒化シリコン膜において、窒化シリコン膜中の窒素原子とシリコン原子にそれぞれに結合した水素密度の和が、膜の構造の緻密性、耐湿性を支配していることを解明して、保護膜として適当な結合水素密度を与え、窒化シリコン膜の製膜条件の設定を容易にする。

【構成】 絶縁基板上に、少なくとも非単結晶シリコンからなる半導体層と金属電極を有する薄膜半導体装置において、前記半導体層と金属電極上の絶縁層膜として用いる窒化シリコン膜の窒素原子と珪素原子にそれぞれ結合した水素原子の総数が35原子%以下となることを特徴とする薄膜半導体装置。

